

Building resilience in tourism firms: Evidence from COVID-19

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ARTICLE INFO

Keywords:

COVID-19
Crisis
Dynamic capabilities
Firm-level
Hospitality
Resilience
Tourism

ABSTRACT

Multiple factors determine tourism companies' capacity to resist and overcome disruptive events, such as pandemics or wars. This paper investigates this issue using a sensitivity index and finds that reductions in human capital, bigger size, and higher past profitability diminish resilience, while higher leverage and capital intensity strengthen it. Our findings further suggest that these effects differ across countries and underscore the negative consequences of Eurozone membership. This paper broadens our understanding of how companies can improve their resilience, providing valuable insights for future preparedness strategies for tourism firms and policymakers.

1. Introduction

In today's volatile global environment, tourism firms face unprecedented challenges in maintaining resilience amid increasing global disruptions. Having just recovered from the COVID-19 pandemic, the industry currently faces challenges from escalating geopolitical tensions and emerging commercial conflicts that disrupt touristic activity (UNWTO, 2025). The sector's substantial economic contribution to global GDP (World Travel and Tourism Council, 2024) underscores the critical importance of understanding and enhancing company resilience (CR), particularly given its severe vulnerability to external events (Espiner and Becken, 2014; Prayag et al., 2020). Several factors have been found to contribute to this vulnerability, from seasonality and high capital intensity (Srhoj et al., 2024), heavy demand dependency and reliance on mobility (Archanskaia et al., 2023), to high leverage and investment requirements affecting solvency (Singal, 2015; Vinod, 2020), coupled with reduced firm size (Jiang et al., 2019; Tanner et al., 2022) that often leads to resource constraints and lack of expertise (Ates and Bititci, 2011; Burnard and Bhamra, 2011). Investigating and promoting resilience amongst these firms is the pathway to reduce their vulnerabilities (Doğantan and Akoğlan Kozak, 2019).

The COVID-19 pandemic was a clear example of these

vulnerabilities, sharply reducing international flows and GDP (UNWTO, 2021a), with the industry only recovering to pre-pandemic levels in 2024 (UNWTO, 2025). This slower-than-anticipated recovery now faces additional challenges from geopolitical tensions and trade disputes, which are creating significant currency fluctuations and economic uncertainty. Of particular concern is the impact on American tourists, a crucial source market driving post-pandemic recovery (UNWTO, 2024), as recent currency devaluations and commercial tensions threaten to reduce their purchasing power, potentially creating another significant shock to the global tourism industry. These emerging challenges make understanding and enhancing firm resilience more critical than ever, particularly since previous research shows that many tourism-related firms lack the resilience to withstand such disruptions (Wieczorek-Kosmala, 2022) and perceive themselves as less resilient than their peers in other industries (Ntounis et al., 2022). Given this context, there is an urgent need to understand what factors enable some tourism firms to maintain resilience while others struggle.

Prior research on resilience in tourism has followed several distinct streams. At the macro level, studies have focused on destination resilience and vulnerability (Bhaskara and Filimonau, 2021; Espiner and Becken, 2014; Filimonau and De Coteau, 2020; Iacobucci and Perugini, 2021), examining how tourist destinations and tourism-dependent

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regions can improve their resilience and adapt to changing market conditions. At the micro level, when examining firm-level resilience, existing research has primarily relied on stock market reactions as resilience metrics (Abdelsalam et al., 2023; Jaroenjitrkam et al., 2023; Kaczmarek et al., 2021; Nguyen et al., 2022; Torres and Augusto, 2021), analyzing how listed companies' share prices respond to disruptive events. Other studies investigate the firm-level determinants of resilience through scales of self-reported resilience (e.g., Chowdhury et al., 2019; Hussain and Malik, 2022; Marco-Lajara et al., 2022; Mohammad et al., 2022; Verfürth et al., 2022), adopting measures of performance as proxies of resilience (Lee et al., 2024; Safón et al., 2024; Woo et al., 2024) or without proposing any practical resilience metrics susceptible of application by industry managers (Amaral and Da Rocha, 2023; Chen et al., 2022; Ghaderi et al., 2022; Liu et al., 2024; Yilmaz et al., 2024).

As a result, several critical gaps remain in our understanding of tourism firm resilience. First, there is a notable absence of quantitative metrics that can be widely applied to effectively assess and compare company resilience levels, particularly across industries and countries. Practical tools that can be consistently applied by both researchers and industry practitioners remain limited, which has delayed not only academic progress in understanding what makes firms resilient but also practitioners' ability to evaluate and enhance their organizations' resilience capacity. Second, the predominant focus on listed companies has left a significant knowledge gap regarding smaller, non-listed firms that comprise the majority of the sector. Lastly, while previous research has identified various factors contributing to resilience, there is limited empirical evidence on how these factors interact and vary across different contexts, specifically concerning the different legal mechanisms in Eurosystem and non-Eurosystem Member-States.

To address this gap in the literature, this paper employs binary logistic regression models and examines the resilience of hospitality firms to COVID-19, and how such resilience is influenced by specific firm characteristics. We find that reductions in human capital, firm size, and past profitability reduce the likelihood of resilience, while leverage and capital intensity increase it. Importantly, evidence suggests that these effects vary by country, with our findings indicating that companies based in Sweden stand at an advantage when compared with the rest. We enhance the analysis by looking at Eurosystem membership, uncovering potential challenges linked to the unified monetary policy. We investigate how this affects CR and provide insights into the role played by this differentiation in monetary governance, offering a deeper understanding of the interplay between policy frameworks and CR.

Our theoretical contributions advance multiple streams of literature. First, we respond to the call for further exploration of the impact of firm-level characteristics in CR (Lee et al., 2024) by providing empirical evidence of how specific attributes influence firm resilience in crisis contexts. Our results not only confirm the critical role of human capital but also reveal an unexpected negative effect of profitability, introducing a novel perspective on how past performance might lead to organizational vulnerability. Second, our findings extend the resource-based view (RBV) proposed by Wernerfelt (1984) by demonstrating how different organizational resources contribute distinctly to resilience during crises. We also advance the dynamic capabilities literature (Ambrosini and Bowman, 2009), by showing how firms' ability to reconfigure their resources can affect their resilience capacity, particularly in a sector of high environmental dynamism. Third, our proposal and application of a sensitivity index as a measure of resilience represents a methodological contribution that bridges the gap between theoretical frameworks and empirical measurement of organizational resilience. This index provides a novel approach to operationalizing resilience within these theoretical frameworks, providing future researchers with a tool for measuring resilience in business contexts.

This study offers valuable and practical insights for multiple stakeholders in the tourism sector. For managers, our findings provide actionable guidance in building CR. The application of our resilience index serves as a practical diagnostic tool through which companies can

assess their resilience to shocks and benchmark against industry peers. More specifically, our results reveal critical areas requiring managerial attention: the importance of maintaining human capital during crises and the need to remain vigilant despite strong financial performance, urging managers to avoid complacency and overconfidence during profitable periods, exercising caution with layoffs or salary reductions as solutions to reduce costs.

For policymakers, our findings regarding monetary policy and Eurosystem membership highlight how institutional frameworks significantly influence firm resilience, providing evidence-based insights for economic policy design. Furthermore, our country-specific findings, particularly regarding Swedish firms' propensity for resilience, offer valuable lessons for policy development and risk mitigation in other nations.

This paper is structured as follows: Section 2 presents the literature review; Section 3 addresses methodological aspects; Section 4 reports the findings; which are discussed in Section 5; Section 6 concludes.

2. Literature review

2.1. Theoretical framework: The resource-based view (RBV)

This study is grounded in the RBV (Barney, 1991; Wernerfelt, 1984), which posits that firms' competitive advantage stems from their set of valuable, rare, inimitable, and non-substitutable resources. According to this theoretical framework, organizational success and survival depend on a firm's ability to acquire and maintain these resources, which can be tangible (such as physical and financial assets) or intangible, such as human capital (Barney, 2001).

In this sense, the RBV is particularly relevant for the study of CR because it explains how different sets of resources can lead to varying levels of organizational resilience during crises. This theoretical framework suggests that firms with superior resources and the ability to leverage them are also better positioned to develop the capacity to withstand and recover from external shocks. Furthermore, the dynamic capabilities extension of RBV (Ambrosini and Bowman, 2009; Teece et al., 1997) emphasizes how firms must remain vigilant, continuously adapting their resources to remain competitive in ever-changing business environments. Thus, this theoretical framework is especially pertinent for understanding resilience in volatile contexts like the tourism industry.

Recent studies have defended the utility of the RBV in explaining resilience in tourism settings. For example, Lee et al. (2024) applied this theoretical framework to assess and compare the resilience of hospitality firms during both the 2008 financial crisis and the COVID-19 pandemic, highlighting how strategic internal resources played an important role in the process. More recently, Suder et al. (2025) adopted this framework to investigate the resilience of small hotels in Poland. The authors argue that organizational performance affects the availability of resources, which in turn influences CR. As such, firms with fewer resources may struggle to develop resilience due to a limited ability to build or adapt their capabilities. Similarly, Woo et al. (2024) further investigate the resilience of hotels, by building on the RBV and incorporating the theoretical insights of slack resources theory, focusing on how the availability of internal slack resources can increase resilience when access to external resources becomes limited.

2.2. Resilience in the tourism industry

The concept of resilience, initially defined in ecology by Holling (1973) as the ability of systems to absorb changes and persist, has evolved and is currently regarded as a set of three complementary attributes instead: persistence, adaptability, and transformability (Folke et al., 2010). Within resilience theory, persistence represents the ability to maintain core functions while operating within the existing parameters (Folke et al., 2010). Adaptability is the capacity to learn and adapt

in response to internal and external stimuli (Folke et al., 2010), while transformability describes the ability to fundamentally restructure the operational model when the existing one becomes unsustainable (Walker et al., 2004).

These capabilities are closely aligned with RBV principles and dynamic capabilities theory (Ambrosini and Bowman, 2009; Wernerfelt, 1984), which emphasize that sustaining competitive advantage requires, more than just having valuable resources, the ability to reconfigure and adapt these resources in response to environmental changes. In business contexts, resilience has been conceptualized as both an outcome and a process (Linnenluecke, 2017; Williams et al., 2017), including the organizational responses to both unexpected disruptions and gradual changes (Williams et al., 2017).

While resilience research in tourism remains scant, it is recognized as a multidisciplinary (Hall et al., 2023) and dynamic process (Amaral and Da Rocha, 2023; Liu et al., 2024), with distinct determinants in different contexts and events (Orchiston et al., 2016; Sobaih et al., 2021). Some conceptual studies have examined resilience within the tourism industry (e.g., Cochrane, 2010; Espiner et al., 2017; Lew, 2014; Strickland-Munro et al., 2010). Additionally, some case studies have focused on the resilience of tourism destinations and regions (Cochrane, 2010; Terhorst and Erkuş-Öztürk, 2019), tourism communities (Lew, 2014; Orchiston, 2013; Strickland-Munro et al., 2010) and sub-systems (Becken, 2013). Other research addresses resilience in niches, including reef tourism (Biggs, 2011; Biggs et al., 2012) and ethnic tourism (Lin and Wen, 2021). However, firm-level analysis of resilience determinants remains relatively unexplored (Usher et al., 2019), particularly regarding the specific organizational characteristics that enable some tourism businesses to better withstand disruptions, with several questions remaining unanswered in the tourism and hospitality literature (Hall et al., 2023).

Recently, the COVID-19 pandemic has turned the attention of scholars to the investigation of firm-level determinants of resilience. In the accommodation sector, this emerging topic has developed across several main streams. First, studies examining financial determinants of resilience have produced mixed results. Using profitability as a resilience proxy, Lee et al. (2024) find that certain firm-specific factors enhanced the resilience of hospitality firms during COVID-19, with greater effects than during the 2008 financial crisis, suggesting that CR determinants are contingent on the business environment and type of disruption. While Tascón et al. (2023) and Ramelli and Wagner (2020) corroborate the positive role of profitability and liquidity, they report conflicting findings regarding leverage and capital intensity. These inconsistencies are further evidenced in studies by Song et al. (2021) and Nguyen et al. (2022), particularly regarding leverage, firm size, and profitability impacts.

A second stream focuses on operational adaptations and strategic responses. Lai and Wong (2020) document how crisis management practices were implemented by hotels across different pandemic stages, while Dogru et al. (2023) reveal how different business models produced different levels of resilience to COVID-19. Their conclusions relate to the dynamic capabilities literature and are complemented by the finding of Hussain and Malik (2022) on the interaction between dynamic capabilities and hotel resilience.

The human capital dimension constitutes a third research stream. For example, Filimonau et al. (2020) show that organizational resilience, organizational response to COVID-19 and Corporate Social Responsibility (CSR) practices improve perceived job security, which subsequently influences managers' commitment to the company. In the same vein, Sobaih et al. (2021) link managers' commitment and proactiveness positively influenced the resilience of small hospitality firms, which supports previous research showing how work engagement (Biggs et al., 2012; Engeset, 2020; Orchiston et al., 2016) and psychological capital (Fang et al., 2020; Pathak and Joshi, 2021; Prayag et al., 2020; Tanner et al., 2022) contribute to organizational resilience.

A fourth research stream, related to the third one, comprises the literature on family bonds and social capital. Amaral and Da Rocha

(2023) and Memili and Koç (2023) are among the first to examine family firms' specific resilience attributes in the hospitality industry, while Marco-Lajara et al. (2022) highlight the role of CSR practices in rural hotel resilience.

Overall, this diverse body of research, synthesized by Hall et al. (2023), reveals significant gaps in our understanding of tourism firm resilience. The conflicting findings regarding key determinants, coupled with the emerging importance of previously underexplored factors, highlight the need for a more comprehensive investigation of what enables some tourism firms to maintain resilience while others struggle.

2.3. Tourism: Testing resilience and competitive advantages in crisis contexts

Building on the literature review and drawing on the RBV, this study explores how tourism companies' internal resources drive their resilience in crisis contexts. Within this theoretical framework, CR relies on the unique set of resources and capabilities that help businesses secure their competitive advantage even in times of distress. Based on these theoretical insights, this paper identifies eight firm-level characteristics that can affect CR in the tourism industry. These include six financial characteristics (leverage, capital intensity, profitability, liquidity, solvency, and size), two human capital proxies, and firm location. We follow with a discussion of how each of these characteristics can impact the probability of resilience.

2.3.1. Financial characteristics

Tourism firms rely heavily on fixed assets like properties, aircrafts, or ships (Dimitrić et al., 2019; Jawed et al., 2021; Lee et al., 2024; Vinod, 2020), making them particularly capital-intensive businesses (Lee and Xiao, 2011; Reich, 1993). While these resources can generate stable cash flows during normal operations, they present significant challenges during crises. These assets are often illiquid and not easily sold or repurposed (Alfaro et al., 2020; Singal, 2015), carrying unavoidable fixed costs like depreciation and maintenance even during low utilization periods (Colak et al., 2023; Lai and Wong, 2020; Santos et al., 2022). From an RBV perspective, while fixed assets represent valuable resources, their inflexibility can limit a firm's ability to reconfigure operations during environmental changes (Jawed et al., 2021), potentially hindering resilience. Therefore, we hypothesize a negative effect of capital intensity on CR.

H1. : Higher capital intensity has a negative effect on the likelihood of resilience.

From an RBV perspective, financial resources, including debt capacity, represent critical assets for tourism firms. While leverage can provide resources for growth and operations, particularly given the sector's high collateral availability through fixed assets (Serrasqueiro and Caetano, 2014), it can become a liability during crises. During economic challenges, high leverage increases vulnerability to financial distress by reducing available cash flow (González, 2013; Neise et al., 2021) and limiting operational flexibility. Heavily levered firms typically experience market share losses and lower profitability compared to less levered counterparts (Opler and Titman, 1994; Dimitrić et al., 2019), with reduced access to additional liquidity precisely when it's most needed (Neise et al., 2021). In contrast, in such a setting, companies with lower reliance on debt experience lower interest costs, higher cash flows, and better market performance, which may lead to higher resilience during crises (Kaczmarek et al., 2021; Ramelli and Wagner, 2020; Verfürth et al., 2022). Therefore, we hypothesize that leverage negatively impacts CR.

H2. : Higher leverage has a negative effect on the likelihood of resilience.

Within the RBV framework, liquidity is a critical financial resource that enables firms to maintain operational flexibility and adapt to

environmental changes. In the resilience literature, liquidity represents not just a financial resource but an important form of slack, enabling organizational flexibility and adaptation (Jiang et al., 2019). This slack is particularly crucial in tourism due to the sector's inherent seasonality and high capital intensity (Srhoj et al., 2024). Liquidity is even more critical during economic downturns, acting as a buffer to absorb shocks, sustain operations (Situm, 2023; Song et al., 2021; Srhoj et al., 2024; Wieczorek-Kosmala, 2022), and facilitate strategic adaptation (Biggs et al., 2015). Evidence from COVID-19 demonstrates how firms with limited cash reserves suffered more severely than their peers (Neise et al., 2021; Ramelli and Wagner, 2020), while those maintaining healthy financials showed greater adaptability (Sobaih et al., 2021; Schwaiger et al., 2022). The critical role of slack resources in enabling flexibility and adaptation (Wieczorek-Kosmala, 2022; Carter et al., 2022) leads us to hypothesize a positive relationship between liquidity and resilience.

H3. : Higher liquidity has a positive effect on the likelihood of resilience.

In the context of the RBV, solvency represents a fundamental resource that determines a firm's ability to access other critical resources, particularly during crises. Higher solvency plays an important role in firm survival, since it is associated with lower financial distress risk (Mselmi et al., 2017; Sehgal et al., 2021), higher profitability, and improved credit scores (Dimitrić et al., 2019). These characteristics improve access to financing, flexibility, and security in times of crisis. While solvency issues are common in tourism firms due to their high leverage and capital intensity (Singal, 2015; Vinod, 2020), the COVID-19 pandemic highlighted its crucial role, with 38 % of previously healthy hospitality firms facing insolvency risks (Archanskaia et al., 2023). Strong internal equity provides a foundation for resilience by enabling firms to self-generate capital and maintain strategic flexibility during market fluctuations (Nguyet, 2023). However, firms with solvency issues are often stereotyped and face restricted access to resources (Luo et al., 2021), limiting their ability to adapt to environmental changes. This relationship between solvency, resource access, and adaptive capacity leads us to hypothesize that solvency issues, represented by negative book equity, reduce the likelihood of being resilient.

H4. : Solvency issues have a negative effect on the likelihood of resilience.

According to the RBV, profitability represents both a key resource and a capability to generate additional resources, particularly during crises. Pre-crisis profitability enables firms to build strategic resources through two mechanisms: direct accumulation of financial slack (Wieczorek-Kosmala, 2022) and investment in resilience-building tools (Orchiston, 2013). This dual role is particularly crucial in tourism, where profitability serves as both a buffer during the resistance phase (Nguyet, 2023) and a foundation for recovery (Cheong and Hoang, 2021; Rasoulia et al., 2023). Higher profitability enables firms to develop firm-specific assets (Esteve-Pérez and Mañez-Castillejo, 2008), maintain financial stability (Jawed et al., 2021), and secure external funding when needed (Wieczorek-Kosmala, 2022). Profitability is widely associated with a firm's survival ability (Gémar et al., 2019; Kaczmarek et al., 2021; Neise et al., 2021; Verfürth et al., 2022; Vivel-Búa et al., 2019), liquidity (Wieczorek-Kosmala, 2022), out-performance (Hua et al., 2013), and lower probability of financial distress (Situm, 2023), factors that help firms create the flexibility to endure disruption (Ramelli and Wagner, 2020). For this reason, we hypothesize that profitability positively impacts CR.

H5. : Higher profitability has a positive effect on the likelihood of resilience.

From an RBV perspective, firm size influences both resource availability and resource exploitation. Large firms typically benefit from economies of scale (Chauvin and Hirsche, 1993; Dimitrić et al., 2019),

better access to resources (Smallbone et al., 2012), and greater capacity to weather crises (Cheong and Hoang, 2021; Tong and Serrasqueiro, 2021). Tourism firms are often small (Srhoj et al., 2024; Tanner et al., 2022). Such firms face the "liability of smallness" (Eggers, 2020) due to resource constraints, which results in a higher likelihood of bankruptcy (Vivel-Búa et al., 2019; Williams, 2014). Hence, they are particularly vulnerable during crisis periods (Cucculelli and Peruzzi, 2020). However, size can also hamper agility and adaptation capabilities (Cheong and Hoang, 2021), and smaller firms may demonstrate greater operational flexibility (Nguyen et al., 2022; Orchiston, 2013; Tanner et al., 2022) despite their resource constraints. This dual nature is further complicated by evidence of non-linear relationships between size and performance (Nunes et al., 2010; Situm, 2023), where scale inefficiencies may emerge above certain thresholds (Sehgal et al., 2021). Hence, this paper hypothesizes that firm size is likely to affect the likelihood of tourism firms demonstrating resilience, although the direction of this relationship is not specified.

H6. : Firm size impacts the likelihood of resilience.

2.3.2. Human capital

Within the RBV context, human capital represents an intangible resource capable of conferring unique competitive advantages to tourism firms (Sardo et al., 2018). This resource is particularly vital in tourism (Srhoj et al., 2024), where service quality and differentiated experiences depend heavily on employee skills and capabilities (Biggs, 2011). A comprehensive review of tourism resilience literature reveals that human capital is one of the most explored determinants of resilience in this sector, with both direct and indirect effects on the resilience of these firms (Ramos Jesus et al., 2025). Human capital not only directly influences resilience through employee adaptability and innovation (Colmekcioglu et al., 2022) but also amplifies the impact of other organizational resources (Núñez-Ríos et al., 2022). Evidence suggests that maintaining and developing human capital through employment security, autonomy, and training enhances organizational resilience (Njunguna et al., 2021), while its reduction can impair a firm's ability to adapt and recover from disruptions. Given this central role of human capital in tourism firm resilience, we hypothesize that its reduction negatively impacts resilience.

H7. : Reductions in human capital have a negative effect on the likelihood of resilience.

2.3.3. Location-based factors

According to the RBV, location represents a contextual resource that shapes both the availability and effectiveness of other resources. In the resilience literature, firm location significantly influences resilience through multiple mechanisms, including business environment characteristics, local tourism demand patterns, government policies, and national culture (Ramos Jesus et al., 2025). The COVID-19 pandemic particularly demonstrated how country-specific approaches to crisis management led to varying degrees of business disruption, as evidenced by the contrasting experiences of firms in different European countries (Archanskaia et al., 2023). For instance, while Spanish hospitality firms experienced severe turnover drops, their Swedish counterparts showed greater resilience due to different policy approaches (Andersson and Jonung, 2024). These location-specific factors not only directly affect operational capabilities but also influence firms' access to resources and their ability to maintain their customer base during crises (Verfürth et al., 2022). For these reasons, we hypothesize that firm location impacts the likelihood of resilience. However, the direction of this relationship is not specified.

H8. : The location of the firm impacts the likelihood of resilience.

Within the RBV framework, Eurosystem membership can be defined as an institutional resource that influences firms' access to financial stability mechanisms. COVID-19 posed a significant test to the resilience

of the Euro (Lane, 2021). While a common currency generally benefits member states' economies (Hegerty, 2020; Zimková et al., 2021), its impact on firm resilience operates through multiple channels. The unified monetary policy, while limiting individual countries' policy flexibility (Hegerty, 2020), provides access to institutional support mechanisms and enhanced financial market and price stability (Mooij, 2023). During the COVID-19 crisis, the European Central Bank's response helped protect Eurozone firms through several programs designed to provide liquidity to its member states and companies (Lane, 2021). However, this institutional framework may also create distinct operational contexts that influence firms' resilience and access to resources during crises. Hence, we hypothesize that there are differences between the resilience of companies located in Eurosystem member-states and those outside of it.

H9. : The likelihood of resilience of firms within the Eurosystem is distinct and influenced by different factors than that of their non-Eurosystem counterparts.

In sum, through this research, we aim to answer the following research questions: Are companies more likely to fail because of governmental policies that they do not control? Can location serve as a competitive advantage during downturns? More importantly, do traditional competitive advantages like liquidity and profitability behave as expected under disruptive circumstances? To address these questions, we introduce a novel approach to CR through the application of a sensitivity index adapted from the regional resilience literature.

3. Methodology

3.1. Data

This study starts by identifying all companies with a primary Standard Industrial Classification (SIC) code of 7011 (accommodation services) in the Orbis database provided by Bureau Van Dijk for the period between 2019 and 2022. The companies in the sample had their headquarters located in Belgium, Bulgaria, Croatia, Poland, Portugal, Romania, Serbia, Slovenia, Spain, and Sweden, since companies in these countries are the only ones to report the data we require for our empirical tests. To improve data reliability, observations with missing or null values required for computing variables of interest are deleted. This leads us to a final sample of 6,038 companies. Details about the sample are available in Section 4.1.

3.2. The model

This study employs binary logistic regression models to investigate how the resilience of the sample firms to COVID-19 is influenced by certain specific characteristics, their country of origin, and Eurozone membership. The application of binary logistic regression is driven by both the research question and the nature of the phenomenon under study. Our research question focuses on understanding the factors determining a firm's likelihood of resilience, rather than predicting exact resilience index values, since these are meaningful only in relative terms. Therefore, transforming the resilience index into a binary dependent variable and employing logistic regression is the most appropriate methodological option, capable of providing meaningful insights into the factors influencing the probability of firm resilience. The models were estimated using SAS 9.4 and SAS Enterprise Guide 7.1 software. Eq. (1) presents the general model:

$$\ln\left(\frac{P_{(RESILIENT_i)}}{1 - P_{(RESILIENT_i)}}\right) = \beta_1 + \beta_2 LEV_i + \beta_3 CAP_i + \beta_4 ROA_i + \beta_5 LIQ_i + \beta_6 SIZE_i + \beta_7 REDHC_i + \beta_8 REDSAL_i + \beta_9 NEGCP_i + \beta_{10} COUNTRY_i \quad (1)$$

Three different specifications are, however, employed. The first considers the total sample and helps investigate the impact of firm-level characteristics and country of headquarters on the likelihood of a firm being resilient. The two alternative models divide the initial sample between companies that are headquartered in Eurozone and non-Eurozone member states, respectively. These specifications help examine whether there are significant differences in the effect of firm-level characteristics on CR between these important subsamples.

3.2.1. Dependent variable

The dependent variable in Eq. (1) is computed following Iacobucci and Perugini (2021). Specifically, for each firm, a resilience index is employed to measure CR, which is computed as per Eq. 2:

$$R_i = \frac{\left(\frac{GVA_{i,t+1}}{GVA_{i,t-1}}\right)}{\left(\frac{GVA_{c,t+1}}{GVA_{c,t-1}}\right)} \quad (2)$$

Where $GVA_{i,t+1}$ ($GVA_{c,t+1}$) represents the Gross Value Added (GVA) for firm i (country c) at the end of the period of interest (i.e., 2022) and $GVA_{i,t-1}$ ($GVA_{c,t-1}$) is the same but for the peak year (i.e., 2019). As can be seen, the index is built in relative terms, as the resilience of a given firm is compared to that of its industry's country average (Iacobucci and Perugini, 2021). Accordingly, firms with an index value above 1 are classified as resilient, while others are considered non-resilient. This classification allows for the identification of which firms outperform their national industry average in terms of resilience. Importantly, the use of a relative measure of change reduces the influence of outliers, such as extremely large firms with large GVA values, by comparing relative changes in performance across different economic contexts and firm sizes instead of absolute changes.

3.2.2. Independent variables

Following our research questions, eight firm-level characteristics are used as independent variables. Six relate to financial characteristics; two represent proxies for human capital and the final one captures the location of the companies' headquarters. Table 1 summarizes the relevant information about these variables.

3.2.3. Diagnostic tests

This study applies diagnostic tests to assess the models' performance and their goodness of fit. As recommended by Thompson et al. (2017), the presence of multicollinearity is analyzed through multiple diagnostics, namely the correlation matrix, Variance Inflation Factor (VIF) values, eigenvalues, condition indices, and linear regression models between independent variables. We additionally regress the dependent variable on each independent variable, individually, to analyze any changes in sign, significance, or magnitude that could nevertheless indicate the presence of multicollinearity in our model.

Table 1
Independent variables.

Variable	Variable description	References
Leverage (LEV)	Weight of the total debt on the total assets	(Carter et al., 2022; Crespi-Cladera et al., 2021; Kaczmarek et al., 2021; Lee et al., 2024; Singal, 2015; Situm, 2023; Song et al., 2021; Verfürth et al., 2022; Wiczorek-Kosmala, 2022)
Capital Intensity (CAP)	Weight of the total fixed assets on the total assets	(Jawed et al., 2021; Lee et al., 2024; Santos et al., 2022; Singal, 2015)
Return on Assets (ROA)	Ratio of net income to total assets	(Kaczmarek et al., 2021; Lee et al., 2024; Orchiston, 2013; Santos et al., 2022; Situm, 2023; Song et al., 2021; Wiczorek-Kosmala, 2022)
Liquidity (LIQ)	Ratio of current assets to current debt	(Carter et al., 2022; Crespi-Cladera et al., 2021; Lee et al., 2024; Wiczorek-Kosmala, 2022)
Firm size (SIZE)	Natural logarithm of total assets	(Carter et al., 2022; Dimitrić et al., 2019; Lee et al., 2024; Nguyen et al., 2022; Situm, 2023; Song et al., 2021)
Human Capital	REDHC Dummy variable: 1 if the firm reduced the number of employees in 2020; 0 otherwise	(Biggs, 2011; Biggs et al., 2015, 2012; Lee, 2014; Njunguna et al., 2021; Srhoj et al., 2024)
	REDSAL Dummy variable: 1 if the firm reduced the average staff expenditure per employee in 2020; 0 otherwise	
Solvency (NEGCP)	Dummy variable: 1 if the firm has negative shareholder equity in 2019; 0 otherwise	(Dimitrić et al., 2019; Luo et al., 2021; Schwaiger et al., 2022; Situm, 2023)
Location (COUNTRY)	Categorical variable defined as each country's ISO 3166-1 alpha-2 code	(Dimitrić et al., 2019; Kaczmarek et al., 2021; Liu et al., 2024; Ntounis et al., 2022; Situm, 2023)

Source: Own elaboration

4. Results

4.1. Sample characterization – resilience index

Table 2
Sample characterization: Number of resilient and non-resilient companies.

Country	Resilient	Non-Resilient	Total	% Resilient
BE	39	38	77	50.65
BG	51	58	109	46.79
ES	1312	1385	2697	48.65
HR	133	185	318	41.82
PL	202	183	385	52.47
PT	348	580	928	37.50
RO	338	243	581	58.18
RS	68	79	147	46.26
SE	492	180	672	73.21
SI	35	89	124	28.23
Total	3018	3020	6038	49.98

Source: Own elaboration

Table 2 summarizes the distribution of firms across countries. As shown, Spain accounts for nearly half of the sample (44.67 %), while Belgium is the least represented country, with only 77 observations.

The last column indicates that 73.21 % of Swedish companies are classified as resilient, while this proportion is only 28.23 % in Slovenia. Table 2 further reveals that most firms from Belgium, Poland, Romania, and Sweden are categorized as resilient. In contrast, Bulgaria, Spain, Croatia, Portugal, Serbia, and Slovenia exhibit the opposite pattern.

Importantly, nearly half of the firms in the sample are classified as resilient, illustrating an equitable distribution in terms of CR. Our index specification, based on relative measures of change rather than absolute ones, combined with this equitable distribution, provides reassurance that this measure of resilience is not affected by potential outliers, such as larger companies with significantly higher GVA compared to their peers.

Table 3
Descriptive statistics – independent variables in the year of 2019.

Variable	Sample	Mean	Std. Dev.	Minimum	Maximum	Median	Mann-Whitney Test and Chi-Square Test
LEV (%)	Total	53.25	37.14	0.10	559.68	51.01	
	Non-Resilient	49.87	35.11	0.14	411.6	46.81	< 0.0001
	Resilient	56.63	38.78	0.10	559.68	55.97	
CAP (%)	Total	55.95	31.93	0	99.95	62.31	
	Non-Resilient	55.84	31.80	0	99.95	61.95	0.6900
	Resilient	56.05	32.06	0	99.91	62.70	
ROA (%)	Total	6.02	16.42	-174.97	149.36	3.57	
	Non-Resilient	7.86	15.63	-174.97	149.36	4.61	< 0.0001
	Resilient	4.18	16.98	-173.12	101.1	2.69	
LIQ (%)	Total	340.54	1116.19	0.08	21675.22	118.96	
	Non-Resilient	347.48	1131.48	0.08	21294.44	123.91	0.0209
	Resilient	333.60	1100.82	0.08	21675.22	115.14	
SIZE	Total	14.54	1.83	6.05	22.56	14.72	
	Non-Resilient	14.68	1.83	6.05	20.58	14.87	< 0.0001
	Resilient	14.40	1.82	6.14	22.56	14.54	
REDHC	Total	0.75	0.43	0	1	1	
	Non-Resilient	0.80	0.40	0	1	1	< 0.0001
	Resilient	0.71	0.45	0	1	1	
REDSAL	Total	0.64	0.48	0	1	1	
	Non-Resilient	0.68	0.47	0	1	1	< 0.0001
	Resilient	0.61	0.49	0	1	1	
NEGCP	Total	0.05	0.21	0	1	0	
	Non-Resilient	0.04	0.19	0	1	0	0.0090
	Resilient	0.05	0.22	0	1	0	

Source: Own elaboration

4.2. Descriptive statistics – independent variables

Descriptive statistics for the independent variables are presented in Table 3, covering the total sample and dividing the sample into resilient and non-resilient firms according to the resilience index.

As can be seen, on average, debt accounts for 53.25 % of the total assets of the sample firms and fixed assets represent an average of 55.95 % of total assets. Profitability ranges from -174.97–149.36 %, with a mean of 6.02 %. The average liquidity is 3.41 euros of current assets per euro of current debt, indicating good coverage of short-term debt by current assets. Size has a mean of 14.54, with a standard deviation of 1.83, and ranges from 6.05 to 22.56. Regarding human capital, 75.00 % of companies reduced their workforce (REDHC) and 64.00 % reduced their average staff expenditure per employee (REDSAL) in 2020. Finally, only 5.00 % of the companies reported negative book equity (NEGCP). It must be noted that the liquidity variable presents a large standard deviation, reflecting the presence of extreme values (e.g., firms with very low short-term debt or high current assets). However, the relative nature of the resilience index and the methodology employed in this study contributes to mitigating the potential influence of these outliers on the estimation results.

Table 3 also presents separate statistics for resilient and non-resilient companies. Unreported results from a Kolmogorov–Smirnov test indicate that the data is not normally distributed, a conclusion that holds for all the independent variables. Thus, this paper uses the Mann–Whitney non-parametric test to test whether there are significant differences in firm-level characteristics between the two groups of interest. Importantly, for the binary variables in Table 3, this paper employs a Chi-Square test of independence. The results of these tests are illustrated in Fig. 1.

As evidenced in Fig. 1, there are statistically significant differences at the 5 % level between resilient and non-resilient firms for all variables except capital intensity. In particular, resilient firms seem to operate with significantly higher leverage, lower profitability, and lower liquidity. Additionally, they are also smaller than their non-resilient counterparts and less likely to reduce human capital or operate with negative book equity.

Table 4 presents the results of Spearman’s rank correlation coefficients among variables, computed for the year of 2019.

The analysis shows that leverage is positively correlated with resilience, meaning that the more leveraged firms are more likely to be resilient. Conversely, profitability and liquidity are negatively

associated with resilience, which contradicts our initial expectations. Additionally, firm size has a negative correlation with resilience. Reductions in human capital also negatively impact resilience, which aligns with our initial expectations. Surprisingly, solvency issues are positively associated with resilience, suggesting that financially vulnerable firms can still display resilience under certain conditions. Finally, the correlation matrix shows no evidence of high correlations between variables (Allison, 1999), since all the correlation coefficients are below the commonly accepted thresholds of 0.80 and 0.90 (Midi et al., 2010).

4.3. Regression results

4.3.1. Diagnostic tests

This paper first discusses the results of the diagnostic tests before presenting the regression analysis. The Hosmer–Lemeshow test for the model encompassing the full sample yields a p-value of 0.78, suggesting a good model fit. The p-values for the Eurosystem and non-Eurosystem specifications are lower, 0.22 and 0.23, respectively. Yet, these results also indicate a good fit for both specifications (Hosmer et al., 2013). Additionally, the area under the Receiver Operating Characteristic (ROC) curve shows that the base model correctly distinguishes between resilient and non-resilient firms approximately 66.50 % of the time, which approaches the threshold for acceptable discriminatory power (Hosmer et al., 2013). According to Hosmer et al. (2013), area under the curve (AUC) values between 0.7 and 0.8 indicate acceptable discrimination, values between 0.8 and 0.9 indicate excellent discrimination, and values above 0.9 indicate outstanding discrimination. The Eurosystem specification has a slightly lower AUC of 64.20 %, while its non-Eurosystem alternative provides the highest discriminatory power, with an AUC of 69.40 %.

We also test for multicollinearity issues by regressing each independent variable on all the other independent variables. All these models have low R-squared values, prompting further analysis of VIF values, which are all below the 2.50 threshold (Allison, 1999; Midi et al., 2010). These low VIF values suggest that the independent variables are not excessively correlated with one another, indicating that multicollinearity is not a concern. Finally, an examination of eigenvalues and condition indices further confirms the absence of serious multicollinearity.

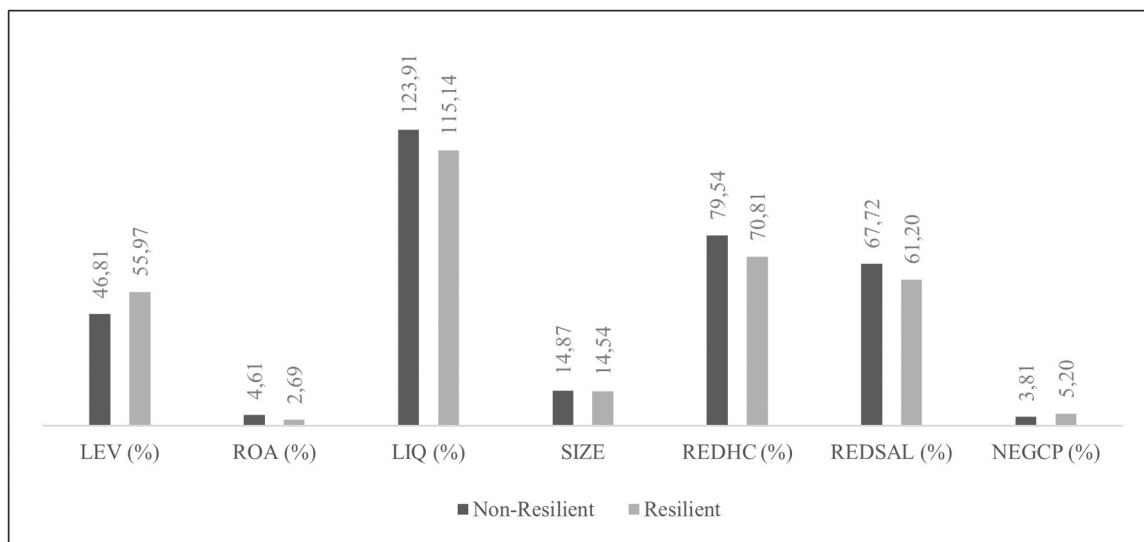


Fig. 1. Comparison of firm-level characteristics between resilient and non-resilient firms, with statistically significant differences at the 5 % level. Source: Own elaboration.

Table 4
Correlation matrix.

	RESILIENT	LEV	CAP	ROA	LIQ	SIZE	REDHC	REDSAL	NEGCP
RESILIENT	1								
LEV	0.100 ***	1							
CAP	0.005	0.008	1						
ROA	-0.136 ***	-0.242 ***	-0.278 ***	1					
LIQ	-0.030 **	-0.468 ***	-0.349 ***	0.246 ***	1				
SIZE	-0.095 ***	-0.157 ***	0.193 ***	-0.078 ***	0.003	1			
REDHC	-0.101 ***	-0.036 ***	-0.011	0.038 ***	-0.022 *	0.100 ***	1		
REDSAL	-0.068 ***	-0.030 **	0.024 *	0.005	0.015	0.011	-0.147 ***	1	
NEGCP	0.034 ***	0.338 ***	-0.023 *	-0.200 ***	-0.137 ***	-0.109 ***	-0.001	0.019	1

Note: ***, **, and * are statistically significant at the 1 %, 5 %, and 10 % level, respectively. Source: Own elaboration

Table 5
Regression results.

	(1) Total sample	(2) Eurosystem member-states	(3) Non-Eurosystem member-states
C	3.206***	1.229***	4.234***
LEV	0.264***	0.190	0.439***
CAP	0.250***	0.224**	0.339*
ROA	-1.836***	-2.884***	-1.038***
LIQ	0.000	0.001	-0.000
SIZE	-0.124***	-0.091***	-0.203***
REDHC	-0.587***	-0.506***	-0.677***
REDSAL	-0.249***	-0.200***	-0.317***
NEGCP	-0.139	0.022	-0.476*
COUNTRY – BE	-1.383***	0.177	-
COUNTRY – BG	-0.948***	-	-0.809***
COUNTRY – ES	-0.908***	0.581***	-
COUNTRY – HR	-1.923***	-	-2.148***
COUNTRY – PL	-0.882***	-	-0.784***
COUNTRY – PT	-1.481***	-	-
COUNTRY – RO	-0.564***	-	-0.580***
COUNTRY – RS	-1.432***	-	-1.421***
COUNTRY – SI	-2.234***	-0.721***	-

Notes: ***, **, and * are statistically significant at the 1 %, 5 %, and 10 % level, respectively. Reference category for COUNTRY is Sweden for models (1) and (3) and Portugal for model (2). Source: Own elaboration

4.3.2. Estimation results

Table 5 presents the results of estimating Eq. (1) with the different specifications mentioned in Section 3.2. The discussion begins with the estimation results from the full sample. As can be seen, the estimated coefficients for leverage, capital intensity, profitability, size, human capital reduction, and location are all statistically significant at conventional levels. Conversely, there is no evidence to support the claim that liquidity and solvency issues have a statistically significant impact on resilience when the other explanatory factors are accounted for.

Some of these results warrant further discussion. Specifically, Table 5 indicates that higher profitability is associated with a lower likelihood of a firm being classified as resilient, which contradicts our initial expectations. Burnett and Johnston (2020), however, suggest that, following a

period of economic stability, managers may become complacent, exhibiting short-sighted behavior and failing to anticipate potential threats, an explanation that may help account for our empirical findings.

Our results also suggest that firm size negatively affects the likelihood of firms being classified as resilient, which is somewhat counter-intuitive. Yet, similar findings have been reported by Nguyen et al. (2022) and Vivel-Búa et al. (2019), who argue that larger firms, all else being equal, tend to have less flexibility to adapt and reduce fixed costs in the short term. Lastly, when using Sweden as the reference category, all the estimated coefficients for the country dummy variables are negative and statistically significant. Importantly, Sweden is used as the reference category because it adopted the most distinctive approach to COVID-19 management within the sample (Andersson and Jonung, 2024), making it a relevant benchmark for interpreting cross-country differences. Consistent with this, the results suggest that, all else being equal, companies headquartered in other countries are less likely to demonstrate resilience than Swedish firms, a finding that is in line with previous research highlighting the strong influence of contextual factors on resilience (Amaral and Da Rocha, 2023; Biggs et al., 2015, 2012; Dahles and Susilowati, 2015; Usher et al., 2019). These findings are discussed in greater detail in Section 5, where we draw on existing literature to contextualize and interpret these associations.

This paper now turns to the discussion of the results from the two alternative specifications, also presented in Table 5. These specifications allow us to investigate whether the determinants of resilience operate differently depending on the firm’s institutional and geographical context. As shown, for companies located in countries within the Eurosystem, the estimated coefficients for capital intensity, profitability, size, and human capital reduction are all statistically significant at conventional levels. Capital intensity positively impacts the resilience of firms, while profitability, size, and human capital reductions have the opposite effect, which is consistent with the findings presented for the base model. Additionally, all country dummy variables are significant at the 1 % level, with the exception of Belgium. Importantly, the estimated coefficient for leverage is now not statistically significant at normal levels. This result suggests that firms headquartered within the Eurosystem do not benefit from the positive effect of leverage, which is in contrast to the conclusion we draw from the base model. Furthermore, there is no evidence that liquidity and solvency issues significantly impact the resilience of firms within the Eurozone, when all other firm characteristics are considered. Finally, these firms exhibit a lower baseline probability of resilience when compared to the base model, even before accounting for firm-level characteristics, as demonstrated by comparing the constant terms from both models.

The results of the specification that only includes firms located

outside of the Eurosystem are also presented in Table 5 and are somewhat different. The estimated coefficients for leverage and solvency issues are now statistically significant at conventional levels, as are those for capital intensity, profitability, size, and human capital reduction. Interestingly, the direction of all these relationships follows the findings reported for the base model. Yet, in terms of magnitude, all these coefficients exert a stronger impact in this specification, except for profitability. This suggests that firms within the Eurozone benefit from a buffering effect, which does not happen outside the Eurozone. As with the previous specifications, the coefficient for liquidity is not statistically significant.

The estimates presented in Table 5 also allow us to compare the determinants of resilience across the full sample, Eurozone firms, and non-Eurozone firms. Some patterns and distinctions emerge from this comparison and are critical to understanding how institutional context shapes resilience. Specifically, only two of the determinants of resilience differ across the three model specifications. In fact, our results suggest that leverage and solvency impact firms headquartered outside the Eurozone, but not firms headquartered within it. This result contradicts the general claim that financial distress reduces the likelihood of CR (Mselmi et al., 2017; Neise et al., 2021; Ramelli and Wagner, 2020; Situm, 2023; Verfürth et al., 2022), highlighting the buffering effect of Eurozone membership. Specifically, while non-Eurozone companies are penalized by their negative book equity, they benefit from a positive effect of leverage, a conclusion that does not hold for their Eurozone counterparts. This comparison of different specifications provides additional insight into how Eurosystem membership influences the resilience determinants of tourism firms. Overall, membership does not appear to significantly alter how the studied characteristics affect resilience. However, firms within the Eurozone benefit from a buffering effect, experiencing reduced impacts from these characteristics on their resilience. Despite this advantage, Eurozone firms face a disadvantage compared to their non-Eurozone counterparts, as they exhibit a lower baseline probability of resilience even before considering firm-level characteristics.

In summary, the empirical findings presented in this study uncover several firm-level characteristics that influence the resilience of firms in the tourism sector. Specifically, capital intensity and human capital levels are consistently associated with greater resilience, while profitability and size have the opposite effect. These results suggest that, in a sector dominated by small firms, with high fixed costs and seasonality, strategic resource allocation can play a more decisive role than size or past performance. Furthermore, differences between Eurozone and non-Eurozone firms underline the importance of institutional context in firms' financial vulnerability and access to support mechanisms. Overall, the results offer practical insights for tourism firms seeking to enhance their resilience to future disruptions.

4.4. Robustness tests

Several robustness tests are conducted using different measures of resilience, size, and profitability. Specifically, for an alternative measure of resilience, each firm is benchmarked against the sample average, instead of the country average. Furthermore, since the hotel industry often operates under franchising and management contracts, which are not reflected in a firm's assets, we compute the logarithm of revenue (Lee and Xiao, 2011) as an alternative measure of size. Finally, this paper tests two alternative measures of profitability, by computing ROA based on Earnings Before Interest and Taxes (EBIT) and Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA). All the robustness test results confirm the direction and significance of the main effects, providing additional support for the main findings of this paper. These are not reported here for brevity but are available upon request.

5. Discussion

Understanding resilience in tourism is essential due to the industry's inherent vulnerabilities. Resilience provides a means to reduce such weaknesses (Doğantan and Akoçlan Kozak, 2019), improve post-disruption performance (Marco-Lajara et al., 2022; Melián-Alzola et al., 2020), and promote the sustainability of the tourism industry (Sobaih et al., 2021).

This study contributes to the growing body of evidence demonstrating that human capital is crucial for the resilience of tourism firms (Ramos Jesus et al., 2025). Employees seem to play a critical role in increasing CR within this industry, through their psychological capital and skills (Pathak and Joshi, 2021; Prayag et al., 2020; Tanner et al., 2022), creativity, innovation, and adaptive capacity (Colmekcioglu et al., 2022), as well as their motivation, engagement and satisfaction (Biggs et al., 2012; Engeset, 2020; Orchiston et al., 2016). Specifically, our results indicate that human capital reductions significantly decrease the probability of a firm being classified as resilient, confirming previous assertions that CR heavily depends on the critical role of employees (Biggs et al., 2012; Njunguna et al., 2021; Prayag et al., 2020; Schwaiger et al., 2022; Tanner et al., 2022). Notably, this conclusion does not depend on firm location, since it is consistent across all three model specifications considered in the analysis.

Solvency issues, represented by negative book equity, are generally expected to reduce CR, as they limit access to financing and increase exposure to financial distress (Dimitrić et al., 2019; Mselmi et al., 2017; Situm, 2023). In tourism, companies with solvency problems were particularly vulnerable during COVID-19 (Crespí-Cladera et al., 2021). Our findings partially corroborate these conclusions, but only for non-Eurozone companies. As such, these results suggest that Eurozone membership may provide a certain degree of institutional protection or alternative financing mechanisms, allowing firms to maintain operations, even under negative book equity.

When analyzing country-level patterns using our relative resilience index, we find that Sweden has the highest proportion of resilient firms, while Slovenia shows the lowest. This cross-country comparison highlights the role of national context in shaping CR. Sweden's performance aligns with prior literature emphasizing how location affects hotel survival and performance (Gémar et al., 2016), primarily through institutional and policy-based competitive advantages (Andres and Round, 2015). In particular, Sweden's unique approach to COVID-19, which relied on individual responsibility rather than strict lockdowns (Andersson and Jonung, 2024; Kavaliunas et al., 2020) likely allowed firms to maintain their customer base and operations by allowing citizens to travel freely (Andersson and Jonung, 2024). These conditions may have positively affected their resilience, as observed in the restaurant industry by Verfürth et al. (2022). In contrast, the low resilience of Slovenian firms may reflect more restrictive pandemic policies or institutional and national differences, though further research is needed to disentangle these effects.

Our findings also point to structural advantages and disadvantages linked to Eurozone membership. First, the findings indicate that firms within the Eurosystem do not appear to benefit from the positive effects of leverage and have a lower probability of being resilient. One possible explanation is that these firms may tend to rely on institutional mechanisms, which may reduce the benefits of leverage (e.g., the increased financial discipline). Second, the analysis reveals that the influence of firm-level characteristics on resilience is more pronounced outside the Eurozone, with the exception of profitability. These patterns may reflect a buffering effect provided by institutional support mechanisms, which, although helpful in the short term, could reduce firms' incentives to improve their operational efficiency and resilience. As a result, these firms may develop lower relative resilience levels when compared to their non-Eurozone counterparts.

The relationship between firm size and resilience is complex and multifaceted, especially in the tourism sector. Companies in this

industry are often small (Srhøj et al., 2024; Tanner et al., 2022), a characteristic that makes them more vulnerable during periods of financial distress. Smaller firms are more likely to go out of business and often face greater obstacles in accessing external funding, along with higher costs of capital (Eggers, 2020; Opler and Titman, 1994; Vivel-Búa et al., 2019). Nonetheless, firm size can also present disadvantages. Larger firms may experience diseconomies of scale, reduced profitability, and increased likelihood of failure (Sehgal et al., 2021; Serrasqueiro and Nunes, 2008; Yazdanfar and Öhman, 2020). Additionally, recent studies have shown that larger firms tend to recover more slowly after disruptions (Nguyen et al., 2022).

The findings of this study lean towards the disadvantages of size in the tourism industry, revealing that larger firms are less likely to be resilient. This may be because, despite having greater resources to overcome challenges, they also have deeply rooted habits and procedures that result in more rigid, less adaptable structures, lacking the flexibility required to adapt. To address these limitations, larger firms can adopt strategies to promote agility and decentralization, such as granting more autonomy to regional units and simplifying decision-making processes. Smaller firms, by contrast, often display higher degrees of operational flexibility and adapt more swiftly to changing market conditions (Biggs, 2011; Eggers, 2020; Nguyen et al., 2022; Orchiston, 2013; Tanner et al., 2022). Additionally, their asset-light structures allow them to adapt more efficiently (Vivel-Búa et al., 2019), which is likely a key factor contributing to their resilience.

A few results, however, contradict our initial expectations. One of the most unexpected results is the negative relationship between profitability and resilience, which appears counterintuitive. Similar findings have, however, been reported by Song et al. (2021) in the restaurant industry, suggesting the existence of a complacency effect. According to this view, the prolonged period of sustained growth and profitability in the tourism sector (Brouder, 2020; UNWTO, 2021b, 2019) may have led managers to become overconfident and less proactive in preparing for crises (Burnett and Johnston, 2020). Consequently, firms that were highly profitable before the pandemic may have experienced larger profitability gaps during the crisis, leading to greater vulnerability (Song et al., 2021). A notable example of the nefarious effect of complacency in the tourism sector can be found in Hilton's trajectory prior to 2007. Despite being an internationally recognized hotel brand, the company had, according to its CEO, entered a state of strategic inertia that made it vulnerable to the disruption caused by the financial crisis (Raval and Sugiura, 2024). As a result, the effects of this complacency could only be reversed after a radical transformation focused on innovation, efficiency, and cultural renewal.

This paper also finds that leverage positively impacts CR, which contrasts with our initial expectations. One possible explanation is that key stakeholders may be more willing to provide additional support to these firms, to avoid total losses on their initial investments (Andrade and Kaplan, 1998; Jiang et al., 2014). This result is also consistent with the agency theory, which highlights several advantages of using debt, such as the tax shield, and the mitigation of agency costs through the additional discipline and efficiency required to manage cash flow and meet debt obligations (Jensen, 1986). Moreover, the results also indicate that capital intensity positively impacts CR. While this also diverges from our initial hypotheses, it aligns with previous findings that companies with higher asset growth were more resilient during COVID-19 (Kaczmarek et al., 2021), as fixed assets can serve as long-term sources of cash flow. Similarly, Song et al. (2017) also find evidence that capital-intensive firms tend to experience lower declines in stock value during uncertain times when compared to their less capital-intensive counterparts.

Overall, these findings suggest that tourism firms can enhance their resilience by investing in strategic assets, preserving human capital, and avoiding over-reliance on past performance. Managers should periodically assess their resource allocation and introduce resilience thinking into day-to-day decision-making, particularly in high-risk or highly

volatile business environments.

6. Conclusion

This study advances our understanding of how various determinants influence the ability of tourism firms to withstand and recover from crises, offering significant theoretical and practical contributions. From a theoretical perspective, our work extends multiple literature streams. First, we provide a comparative analysis of factors impacting tourism firms' resilience across various countries, thereby addressing the research gap identified by Lee et al. (2024). Second, the adaptation and application of a company resilience index represents a methodological advancement that serves as a bridge between theoretical frameworks and the empirical measurement of resilience in business contexts. Third, our findings contribute to the literature on the RBV (Wernerfelt, 1984) and dynamic capabilities (Ambrosini and Bowman, 2009) by demonstrating how specific organizational resources can contribute to resilience during crises. To the best of our knowledge, this is the first study to introduce a sensitivity index as a measure of resilience within these theoretical frameworks, thus offering researchers a practical tool for analyzing and comparing resilience across companies, sectors, and countries.

6.1. Implications and limitations

From a practical standpoint, our findings yield important implications for both managers and policymakers. For managers, we provide evidence-based strategies for building CR. The study emphasizes the critical role of human capital, demonstrating that reducing it significantly undermines resilience. However, further research is needed to fully understand this effect, given its potential to amplify the impact of other determinants (Núñez-Ríos et al., 2022). The results regarding the negative impact of profitability on resilience may serve as a cautionary warning against managerial complacency, highlighting the importance of long-term thinking and encouraging firms to avoid short-sighted decisions that may compromise their capacity to withstand future crises. Additionally, the resilience index can serve as a useful instrument for self-assessment and benchmarking.

For policymakers, our findings underscore the role of institutional frameworks in promoting firm-level resilience. Rather than relying exclusively on reactive support mechanisms, policy efforts should be proactive and help firms build their internal capabilities. Such a policy shift can contribute to reduce firms' structural dependence, promoting their long-term resilience, sustainability, and autonomy. Furthermore, our analysis suggests the need to investigate regional practices and government policies that can be replicated and benefit firms elsewhere. These insights are particularly relevant for tourism-dependent economies and provide concrete, actionable recommendations for developing robust resilience strategies.

While this study provides valuable insights into tourism firms' resilience, some limitations arise, mainly due to data availability. First, our geographical scope was limited to European nations, as our database does not include GVA data from other major tourism markets, such as the United States, Turkey, or Asian countries. Future research should, therefore, seek to expand the geographical coverage to include these regions, enabling cross-country comparisons and enhancing the generalizability of results. Second, due to data constraints, both human capital proxies refer to quantitative aspects of human capital management during crises. As such, they do not capture qualitative dimensions such as employee education levels and investment in training. Future studies should collect and incorporate information regarding these qualitative human capital indicators, along with additional managerial characteristics, innovation practices, and CSR initiatives, to provide a more comprehensive understanding of how these qualitative aspects can influence firm resilience.

Additionally, the absence of mandatory reporting requirements for

GVA data reduced both our sample size and geographical coverage. Addressing this limitation in future studies through the use of alternative datasets, survey-based approaches, or longitudinal analyses could further enrich our understanding of resilience dynamics in the tourism sector. Alternatively, future studies can also develop an alternative metric to compare companies based on more commonly reported data, to enable broader international comparisons.

Despite these constraints that limit the generalizability of our findings, this study provides meaningful insights into CR determinants within the tourism sector, opening several avenues for future research.

CRedit authorship contribution statement

Célia Maria Quitério Ramos: Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Luís Miguel Serra Coelho:** Writing – review & editing, Validation, Supervision, Software, Resources, Project administration, Methodology, Conceptualization. **Carina Ramos Jesus:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used Grammarly and ChatGPT 4.0, a proprietary large language model provided by OpenAI, in order to enhance language and readability, as well as for proofreading spelling and grammar. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Carina Ramos Jesus reports financial support was provided by Foundation for Science and Technology. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors are grateful to three anonymous referees for their insightful comments and suggestions, that greatly improved the quality of this work, as well as the support of the Editor. This paper was financed by the FCT – Foundation for Science and Technology, within the Ministry of Education, Science and Innovation, via National Funds from the State Budget, through the Studentship for Doctoral Research with the reference UIDB/152309/2021 (DOI: <https://doi.org/10.54499/UI/BD/152309/2021>) and <https://doi.org/10.54499/UI/BD/04020/2020> under the project UID/04020: Research Centre for Tourism, Sustainability and Well-being.

Data Availability

The authors do not have permission to share data.

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